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AMENDMENT

U.S. Appl. No. 10/725,501

Page 6

REMARKS

Claims 1, 3-5, 7-9 and 11-32 are pending.

Claim 29 is withdrawn. If its base claim is allowed it is respectfully requested it be rejoined.

I. Claim Amendments

Claims 1 and 30 were amended to include the features of Claims 6 and 10. Accordingly, Claims 6 and 10 have been cancelled.

New Claim 31 is supported by Claim 20.

New Claim 32 recites an Mg upper limit of 4.85%. Although Alloy 3 in Table 1 at page 10 of the present specification does not have Sc, it is respectfully submitted it supports the feature that the present inventors contemplated an Mg level of 4.85%.

II. 35 USC § 103

Claims 1, 3-28 and 30 stand rejected under 35 USC § 103(a) as allegedly being unpatentable over EP 799900 in view of WO 95/26420 or Baumann et al. (U.S. Patent No. 5,624,632). The Office Action asserts EP '900 teaches each feature of the claims, except for the addition of Sc, for which purpose WO '420 and Baumann et al. are cited. This rejection is respectfully traversed.

Independent Claims 1 and 30 have been amended to recite 0.05 to 0.25 wt. % Zr and 0.1-0.5 wt. % Sc. The Zr ranges of EP '900 are 0.3 wt. % max and 0.10-0.20 wt %.

A. EP 799900 in view of WO '420

A copy of the machine translation of Claims 1 - 7 and other excerpts of WO '420 is attached and will be referred to in various parts of these remarks (ATTACHMENT I).

1. EP 799900 and WO '420 disclose different processes

It is improper to modify EP '900 to add Sc according to the teachings of WO '420, because WO '420 requires a process to be employed when Sc is added which is contrary to the process preferred by EP '900.

An attached machine translation of WO '420, page 1, lines 34-36 indicates a particular process must be employed (ATTACHMENT I).

According to a machine translation, WO '420, Page 2, lines 1-10 discloses:

The goal of this invention is obtained by the manufactoring process of semi-finished products which is composed of:

- * moulding of the ingots at the speed of cooling at the time of crystallization higher than 0,5 °C
 - * homogenisation of the ingots of 430°C with 450 °C
- * hot rolling or pressing at an initial temperature of deformation (of 430 °C with 450 °C) and of end of deformation (300 °C).
- * cold deformation and intermediate annealing processes with 400 °C (speed of deformation lower than 100 S)
- * heat treatment of the semi-finished products. (ATTACHMENT I)

Consistent with this, according to a machine translation, WO '420, Claim 7 discloses:

- 7. Manufactoring process of alloy according to any of the claims (1) to (6) consists:
- * to mould the ingot in a crystallizer with slip at a speed of cooling during crystallization higher than 0,5 °C/s
- * homogenisation of the ingots at a temperature of 430 °C with 450 °C
- * hot deformation (rolling or pressing) after the reheating of the ingot of 430 °C with 450 °C, end of deformation to 300 °C
- * cold deformation due to the intermediate annealing processes at a temperature equalizes with 400 °C, speed of deformation lower than 100s-1 and the heat treatment of the semi-manufactures. (ATTACHMENT I)

An attached machine translation of page 2, lines 12-16 explains as follows why a high temperature of homogenization and hot rolling at high speeds of deformation are avoided.

The defect of the widespread method applied to alloys of aluminium to scandium is that the fact of using a high temperature of homogenisation and hot rolling as high speeds of deformation causes the appearance in the structure of alloy of large secondary precipitates of the ScAl3 phase (diameter more than 200 Nm) and also the aggravation of the effect of age hardening. (ATTACHMENT I)

EP '900 hot rolls at a temperature well above the WO '420 end of deformation lower limit temperature of 300°C. EP '900, page 3, teaches preheating to at least 400°C and hotrolling is difficult below 400°C, so preferably hot rolling begins at about 500°C.

- 2. WO '420, provides no reason to select the particularly recited level of zinc WO '420, Claim 6, according to the machine translation recites the following:
 - 6. Alloy according to any of the claims (1) to (5) is characterized in that these elements can be accompanied by silicon and/or zinc and/or money (sic, silver) and/or lithium and/or cobalt and/or nickel and/or iron from 0,05% to 12% and/or one or more metals of the group of rare earth. (ATTACHMENT I).

However, the machine translation of base Claim 1 appears to require not only scandium, but also vanadium, zirconium and cerium.

1. Alloy based on aluminium primarily including/understanding scandium, vanadium, zirconium and cerium characterized in that it contains (mass in %): Scandium 0,15 - 0,60 Vanadium 0,05 - 0,30 Zirconium 0,05 - 0,30 Cerium 0,05 - 0,30 Each additional component chosen 0,00 - 7,20 among magnesium and/or beryllium, and/or manganese and/or chromium and/or titanium and/or copper and/or molybdenum. (ATTACHMENT I).

In referring to the specification, WO '420, page 3, lines 1-20, according to the machine translation recites the following:

The improvement of the strength properties of aluminium alloys following the method of the treatment is guaranteed by the introduction of the scandium from 0,15 to 0,5 % ' and of the zirconium from 0,05 to 0, 3 %. the alloys can have in their composition one or more elements of the group: * Silicon 0,5-12 * Magnesium 0,5-10 * Copper 0, 5 - 10 * Zinc 0,5 - 10 * Lithium 0,5 - 5,0 * Money (sic, silver) 0,5 - 10,0 (ATTACHMENT I).

However, WO '420, page 3, line 22 - page 4, line 3, according to the machine translation recites the following, which indicates additional elements are required:

The improvement complementary of the whole of the mechanical properties of the alloy semi-manufactures of aluminium to scandium is related to the process of alloy by at least one or more elements of the group:

Manganese 0,30-2,50 Titanium 0,05-0,50 Cerium 0,05-0,30 Chromium plates 0,10-1,00 Vanadium 0,05-0,30 Molybdenum 0,05-0,30 Cobalt 0,05-0,30 Nickel 0,10-1,50 (ATTACHMENT I).

This appears inconsistent with the above-listed machine translation of Claim 1 of WO'420 which requires adding Sc in a range of 0.15-0.60 to aluminium alloys together with vanadium, zirconium and cerium (ATTACHMENT I, machine translation of Claim 1).

Regardless, the above provided descriptions do not select the presently recited combined narrow magnesium, zirconium and scandium ranges. Moreover, none of the exemplified alloys disclosed in WO'420 Tables 1.1, 1.2 or 1.3 have both zinc and scandium. Moreover, the alloys disclosed in Table 2 on page 15, Table 5 on page 16, Table 7 on page 17, and Table 9 on page 18 lack zinc.

WO '420 appears to add Sc and other elements to improve mechanical properties (ATTACHMENT I, machine translation of page 3, line 22 – page 4, line 3). The skilled person when starting from EP'900 with an Al-Mg-Mn-alloy having Zn in a range of 0.4-1.5% would not appreciate from WO '420 that adding Sc would result in a weldable alloy product having improved resistance against exfoliation corrosion, in particular when brought in an sensitized condition to allow temperatures of use above 80°C, as is achieved by the present invention.

Reconsideration is respectfully requested.

B. Baumann et al.

Baumann et al. discloses an aluminium alloy product for use as a damage tolerant product for aerospace applications (see abstract, and column 1, line 36-39). There is no disclosure in this reference that the alloy product disclosed is subjected to or can be subjected to a welding operation. And it is an essential feature of the disclosed alloy product that the composition is substantially zinc-free and lithium-free (see, e.g., claim 1). What is meant by "substantially free" is mentioned in column 2, lines 19-24.

The combination of the teaching of EP '900 and Baumann et al., provided there would be an allowable reason for this combination, would lead the skilled person towards an alloy product having substantially <u>no zinc</u> in view of the teaching of Baumann et al. Thus, the combination of these two prior art documents would lead to a different aluminium alloy product.

Reconsideration is respectfully requested.

III. **Double Patenting**

Claims 1, 3-28 and 30 stand rejected under the judicially created doctrine of obvioustype double patenting as being unpatentable over claims 1-22 of U.S. Patent No. 6,337,147.

Claims 1, 4-28 and 30 stand rejected under the judicially created doctrine of obvioustype double patenting as being unpatentable over claims 1-27 of U.S. Patent No. 6,773,664.

Claims 1, 3-28 and 30 stand provisionally rejected under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 1-16 of copending Application No. 10/776,605 (Pub U.S. Patent Application No. 2004/0161359).

Claims 1, 3-28 and 30 stand provisionally rejected under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10/299,814 (Pub U.S. Patent Application No. 2003/014912).

In response to each of these rejections, Applicants will file Terminal Disclaimers at an appropriate time.

IV. Conclusion

In view of the above, it is respectfully submitted that all objections and rejections are overcome. Thus, a Notice of Allowance is respectfully requested.

Respectfully submitted,

Anthony P. Venturino Registration No. 31,674

APV/bms

ATTORNEY DOCKET NO. APV31528A

STEVENS, DAVIS, MILLER & MOSHER, L.L.P. 1615 L STREET, N.W., SUITE 850 WASHINGTON, D.C. 20036 TEL. 202-785-0100 / FAX. 202-785-0200

ATTACHMENT I - Machine translations of excerpts of WO 95/26420





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 W^{O} $95 \int 2b^{42}$ In English:

The invention refers to the field of the metallurgy aluminium alloys. The aluminium alloys being the subject of the invention contain scandium and are combined with magnesium, copper, zinc, silicon, lithium, with one or more metals of transition from the group of rare earth. These alloys are intended to be used in the industry of manufacture of products semni-finish in a hurry or rolled-iron products.

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Translate again - Enter up to 150 words

L'invention se rapporte au domaine de la métallurgie des alliages d'aluminium. Les alliages d'aluminium faisant l'objet de l'invention contiennent du scandium et sont alliés à du magnésium, du cuivre, du zinc, du silicium, du lithium, à un ou plusieurs métaux

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In English:

pagel, lines 34-36 The fixed goal is obtained not only by the introduction into alloy proposed of scandium, zirconium, cerium, vanadium to the distribution of the components (see Table 1.1), but also by the technology of manufacture of the semi-finished products.

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Le but fixé est obtenu non seulement par l'introduction dans l'alliage proposé de scandium, de zirconium, de cérium, de vanadium à la répartition des composants (Voir Tableau 1.1), mais également par la technologie de fabrication des produits semi-finis.

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wo 95/26420
page 2, Babel Fish Translation to lines 1-10 English:

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The goal of this invention is obtained by the manufactoring process of semi-finished products which is composed of: * moulding of the ingots at the speed of cooling at the time of crystallization higher than 0,5 °C * homogenisation of the ingots of 430°C with 450 °C * hot rolling or pressing at an initial temperature of deformation (of 430 °C with 450 °C) and of end of deformation (300 °C). * cold deformation and intermediate annealing processes with 400 °C (speed of deformation lower than 100 S) * heat treatment of the semi-finished products.

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Le but de la présente invention est obtenu par le procédé de fabrication de produits semifinis qui se compose de: * moulage des lingots à la vitesse de refroidissement lors de la cristallisation supérieure à 0,5 °C

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wo95/26420 In English: page 2
The defect o

12-16

The defect of the widespread method applied to alloys of aluminium to scandium is that the fact of using a high temperature of homogenisation and hot rolling as high speeds of deformation causes the appearance in the structure of alloy of large secondary precipitates of the ScAl3 phase (diameter more than 200 Nm) and also the aggravation of the effect of age hardening.



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Le défaut de la méthode répandue appliquée aux alliages d'aluminium au scandium est que le fait d'utiliser une haute température d'homogénéisation et de laminage à chaud ainsi que des grandes vitesses de déformation provoque l'apparition dans la structure de

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wo 95/26420 Page 2, lines 35-40

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In English:

The use low speeds of cooling from 5 to 10 C/min. at the time of the moulding will not make it possible to have ingots with the state of a supersaturated solid scandium solution in aluminium. The use of high temperatures of homogenisation (more than 450 °C) and of the hot deformation as high speeds of deformation will produce the formation of secondary precipitates of the ScAl phase of more than 100 Nm and the weakening of the strength properties.

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L'utilisation de basses vitesses de refroidissement de 5 à 10 C/min. lors du moulage ne permettra pas d'avoir des lingots à l'état d'une solution solide sursaturée de scandium dans l'aluminium.

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In English:

The use of low temperatures of heat treatment of the ingots lower than 300 °C will cause a decomposition partial of the supersaturated solid scandium solution in aluminium, the reduction on voluminal behalf of the secondary precipitates of the ScAl3 phase and like consequence, the low values of the strength properties. The improvement of the strength properties of aluminium alloys following the method of the treatment is guaranteed by the introduction of the scandium from 0,15 to 0,5 % ' and of the zirconium from 0,05 to 0, 3 %, the alloys can have in their composition one or more elements of the group: * Silicon 0,5- 12 * Magnesium 0,5-10 * Copper 0, 5 -10 * Zinc 0,5 - 10 * Lithium 0,5 - 5,0 * Money 0,5 -10,0 Hardening by the elements enumerated above is obtained by the process of alloy of the solid solution and by the release of the corresponding phases of the hardeners at the time of ageing.

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L'utilisation de basses températures de traitement thermique des lingots inférieures à 300 °C provoquera une décomposition partielle de la solution solide sursaturée de scandium dans l'aluminium, la diminution de la part volumique des précipités secondaires de la

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w095/26420, page 3, line 22 -page 4, line 3

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In English:

The improvement complementary of the whole of the mechanical properties of the alloy semi-manufactures of aluminium to scandium is related to the process of alloy by at least one or more elements of the group: Manganese 0,30-2,50 Titanium 0,05-0,50 Cerium 0.05-0.30 Chromium plates 0.10-1.00 Vanadium 0,05-0,30 Molybdenum 0,05-0,30 Cobalt 0,05-0,30 Nickel 0,10-1,50 The introduction of these elements produces a modification of the structure of the ingot (refinement of the grain), the increase in the temperature of the beginning of recrystallization and temperature of ageing (%) - mass, % The reduction in the content of these elements below the limit indicated causes neither modification of the structure of the ingot, neither the increase in the temperature of the beginning of recrystallization, nor improvement of the mechanical properties.

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L'amélioration complémentaire de l'ensemble des propriétés mécaniques des semi-produits d'alliages d'aluminium au scandium est liée au processus d'alliage par au moins un ou plusieurs éléments du groupe:

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In English:

The increase in the content of the elements indicated involves the formation, in the structure, of great quantities of intermétalloides, the embrittlement of alloys and the weakening of the strength properties. The invention will be included/understood better using illustrative examples. Below the alloy invention of aluminium to scandium under four alternatives with their characteristics and their applications.

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L'augmentation de la teneur des éléments indiqués entraîne la formation, dans la structure, de grandes quantités d'intermétalloides, la fragilisation des alliages et l'affaiblissement des caractéristiques de résistance.

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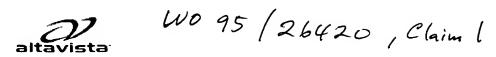
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In English:

1. Alloy based on aluminium primarily including/understanding scandium, vanadium, zirconium and cerium characterized in that it contains (mass in %): Scandium 0,15 - 0,60 Vanadium 0,05 - 0,30 Zirconium 0,05 - 0,30 Cerium 0,05 - 0,30 Each additional component chosen 0,00 - 7,20 among magnesium and/or beryllium, and/or manganese and/or chromium and/or titanium and/or copper and/or molybdenum.

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1. Alliage à base d'aluminium comprenant essentiellement du scandium, du vanadium, du zirconium et du cérium caractérisé en ce qu'il contient (masse en %): Scandium 0,15 - 0,60 Vanadium 0,05 - 0,30 Zirconium 0,05 - 0,30 Cérium 0,05 - 0,30 Chacun des éléments

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In English:

WO' 420 Claim

2. Alloy according to claim (1) characterized in that the additional components are magnesium, manganese, chromium, titanium and beryllium with the following distribution of the components (mass in %): * Magnesium 5,80 -7,20 * Manganese or chromium or titanium 0,05 - 0,30 * Beryllium 0,01 - 0.05

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2. Alliage selon revendication (1) caractérisé en ce que les éléments additionnels sont magnésium, manganèse, chrome, titane et béryllium avec la répartition suivante des composants (masse en %): * Magnésium 5,80 -7,20

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In English:

3. Alloy according to claim (1) characterized in that the additional components are magnesium, manganese, chromium, titanium, and beryllium with the following distribution of the components (mass in %) * Magnesium 1,80 -3,80 * Beryllium 0,001 - 0,005 * Manganese or chromium or titanium 0.050 - 0.400

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3. Alliage selon revendication (1) caractérisé en ce que les éléments additionnels sont magnésium, manganèse, chrome, titane, et béryllium avec la répartition suivante des composants (masse en 🕏) * Maghésium 1,80 -3,80

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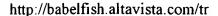
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In English:

wo'420 Claim4 4. Alloy according to claim (1) characterized in that the additional components are magnesium, manganese, chromium, titanium, and coppers with the following distribution of the components (mass in %) * Copper 2,80- 4,50 * Magnesium 1,80- 2,50 * Chromium plate or titanium or manganese 0,05 - 0,50

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4. Alliage selon revendication (1) caractérisé en ce que les éléments additionnels sont magnésium, manganèse, chrome, titane, et cuivre avec la répartition suivante des composants (masse en *)

* Cuivre 2,80- 4,50

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In English:

WO 420

5. Alloy according to claim (1) characterized in that the additional components are manganese, chromium, titanium and molybdenum with the following distribution of the components (mass in %): * Manganese or chromium, or titanium, or molybdenum 0.05 - 0.80.

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5. Alliage selon revendication (1) caractérisé en ce que les éléments additionnels sont manganèse, chrome, titane et molybdène avec la répartition suivante des composants (masse en 1%):

* Manganèse ou chrome, ou titane, ou molybdène 🕍

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In English:

6. Alloy according to any of the claims (1) to (5) is characterized in that these elements can be accompanied by silicon and/or zinc and/or money and/or lithium and/or cobalt and/or nickel and/or iron from 0,05% to 12% and/or one or more metals of the group of rare earth.

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6. Alliage selon l'une quelconque des revendications (1) à (5) est caractérisé en ce que ces éléments peuvent être accompagnés de silicium et/ou zinc et/ou argent et/ou lithium et / ou cobalt et/ou nickel et/ou fer de 0,05% à 12%

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In English:

WO

Claim 7

7. Manufactoring process of alloy according to any of the claims (1) to (6) consists: * to mould the ingot in a 95/26420 crystallizer with slip at a speed of cooling during crystallization higher than 0,5 °C/s * homogenisation of the ingots at a temperature of 430 °C with 450 °C * hot deformation (rolling or pressing) after the reheating of the ingot of 430 °C with 450 °C, end of deformation to 300 °C * cold deformation due to the intermediate annealing processes at a temperature equalizes with 400 °C, speed of deformation lower than 100s-1 and the heat treatment of the semimanufactures.

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7. Procédé de fabrication de l'alliage selon l'une quelconque des revendications (1) à (6) consiste:



* à mouler le lingot dans un cristallisoir à glissement à une vitesse de refroidissement

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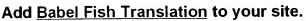
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Machine translation of excerpts of published PCT patent application no. WO95/26420, published October 1995.





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 $\frac{\omega}{95}$ $\int_{26}^{420} \ln \text{English}$:

The invention refers to the field of the metallurgy aluminium alloys. The aluminium alloys being the subject of the invention contain scandium and are combined with magnesium, copper, zinc, silicon, lithium, with one or more metals of transition from the group of rare earth. These alloys are intended to be used in the industry of manufacture of products semni-finish in a hurry or rolled-iron products.

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L'invention se rapporte au domaine de la métallurgie des alliages d'aluminium. Les alliages d'aluminium faisant l'objet de l'invention contiennent du scandium et sont alliés à du magnésium, du cuivre, du zinc, du silicium, du lithium, à un ou plusieurs métaux

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In English:

pagel, lines 34-36 The fixed goal is obtained not only by the introduction into alloy proposed of scandium, zirconium, cerium, vanadium to the distribution of the components (see Table 1.1), but also by the technology of manufacture of the semi-finished products.

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Translate again - Enter up to 150 words

Le but fixé est obtenu non seulement par l'introduction dans l'alliage proposé de scandium, de zirconium, de cérium, de vanadium à la répartition des composants (Voir Tableau 1.1), mais également par la technologie de fabrication des produits semi-finis.

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wo 95/26420
page 2, Babel Fish Translation to lines 1-10 English:

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The goal of this invention is obtained by the manufactoring process of semi-finished products which is composed of: * moulding of the ingots at the speed of cooling at the time of crystallization higher than 0,5 °C * homogenisation of the ingots of 430°C with 450 °C * hot rolling or pressing at an initial temperature of deformation (of 430 °C with 450 °C) and of end of deformation (300 °C). * cold deformation and intermediate annealing processes with 400 °C (speed of deformation lower than 100 S) * heat treatment of the semi-finished products.

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Le but de la présente invention est obtenu par le procédé de fabrication de produits semifinis qui se compose de:

* moulage des lingots à la vitesse de refroidissement lors de la cristallisation supérieure à 0,5 °C

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wo95/26420 In English: page 2
The defect o

The defect of the widespread method applied to alloys of aluminium to scandium is that the fact of using a high temperature of homogenisation and hot rolling as high speeds of deformation causes the appearance in the structure of alloy of large secondary precipitates of the ScAl3 phase (diameter more than 200 Nm) and also the aggravation of the effect of age hardening.

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Le défaut de la méthode répandue appliquée aux alliages d'aluminium au scandium est que le fait d'utiliser une haute température d'homogénéisation et de laminage à chaud ainsi que des grandes vitesses de déformation provoque l'apparition dans la structure de

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In English:

The use low speeds of cooling from 5 to 10 C/min. at the time of the moulding will not make it possible to have ingots with the state of a supersaturated solid scandium solution in aluminium. The use of high temperatures of homogenisation (more than 450 °C) and of the hot deformation as high speeds of deformation will produce the formation of secondary precipitates of the ScAl phase of more than 100 Nm and the weakening of the strength properties.

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Translate again - Enter up to 150 words

L'utilisation de basses vitesses de refroidissement de 5 à 10 C/min. lors du moulage ne permettra pas d'avoir des lingots à l'état d'une solution solide sursaturée de scandium dans l'aluminium.

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altavista: Wo 95/26420 Page 3, lines 1-20

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In English:

The use of low temperatures of heat treatment of the ingots lower than 300 °C will cause a decomposition partial of the supersaturated solid scandium solution in aluminium, the reduction on voluminal behalf of the secondary precipitates of the ScAl3 phase and like consequence, the low values of the strength properties. The improvement of the strength properties of aluminium alloys following the method of the treatment is guaranteed by the introduction of the scandium from 0,15 to 0,5 % ' and of the zirconium from 0,05 to 0, 3 %, the alloys can have in their composition one or more elements of the group: * Silicon 0,5- 12 * Magnesium 0,5-10 * Copper 0, 5 -10 * Zinc 0,5 - 10 * Lithium 0,5 - 5,0 * Money 0,5 -10.0 Hardening by the elements enumerated above is obtained by the process of alloy of the solid solution and by the release of the corresponding phases of the hardeners at the time of ageing.

Search the web with this text

Translate again - Enter up to 150 words

L'utilisation de basses températures de traitement thermique des lingots inférieures à 300 °C provoquera une décomposition partielle de la solution solide sursaturée de scandium dans l'aluminium, la diminution de la part volumique des précipités secondaires de la

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wo95/26420, page 3, line 22 - page 4, line 3

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In English:

The improvement complementary of the whole of the mechanical properties of the alloy semi-manufactures of aluminium to scandium is related to the process of alloy by at least one or more elements of the group: Manganese 0,30-2,50 Titanium 0,05-0,50 Cerium 0,05-0,30 Chromium plates 0,10-1,00 Vanadium 0,05-0,30 Molybdenum 0,05-0,30 Cobalt 0,05-0,30 Nickel 0,10-1,50 The introduction of these elements produces a modification of the structure of the ingot (refinement of the grain), the increase in the temperature of the beginning of recrystallization and temperature of ageing (%) - mass, % The reduction in the content of these elements below the limit indicated causes neither modification of the structure of the ingot, neither the increase in the temperature of the beginning of recrystallization, nor improvement of the mechanical properties.

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Translate again - Enter up to 150 words

L'amélioration complémentaire de l'ensemble des propriétés mécaniques des semi-produits d'alliages d'aluminium au scandium est liée au processus d'alliage par au moins un ou plusieurs éléments du groupe:

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W095/26420 page 4, lines

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In English:

The increase in the content of the elements indicated involves the formation, in the structure, of great quantities of intermétalloides, the embrittlement of alloys and the weakening of the strength properties. The invention will be included/understood better using illustrative examples. Below the alloy invention of aluminium to scandium under four alternatives with their characteristics and their applications.

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Translate again - Enter up to 150 words

L'augmentation de la teneur des éléments indiqués entraîne la formation, dans la structure, de grandes quantités d'intermétalloides, la fragilisation des alliages et l'affaiblissement des caractéristiques de résistance.

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WO 95 / 26420, Claim 1

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In English:

1. Alloy based on aluminium primarily including/understanding scandium, vanadium, zirconium and cerium characterized in that it contains (mass in %): Scandium 0,15 - 0,60 Vanadium 0,05 - 0,30 Zirconium 0,05 - 0,30 Cerium 0,05 - 0,30 Each additional component chosen 0,00 - 7,20 among magnesium and/or beryllium, and/or manganese and/or chromium and/or titanium and/or copper and/or molybdenum.

Search the web with this text

Translate again - Enter up to 150 words

1. Alliage à base d'aluminium comprenant	
essentiellement du scandium, du vanadium, du	
zirconium et du cérium caractérisé en ce qu'il	
contient (masse en %): Scandium 0,15 - 0,60	_
Vanadium 0,05 - 0,30 Zirconium 0,05 - 0,30	
Cérium 0,05 - 0,30 Chacun des éléments	

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In English:

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2. Alloy according to claim (1) characterized in that the additional components are magnesium, manganese, chromium, titanium and beryllium with the following distribution of the components (mass in %): * Magnesium 5,80 -7,20 * Manganese or chromium or titanium 0,05 - 0,30 * Beryllium 0,01 -0.05

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2. Alliage selon revendication (1) caractérisé en ce que les éléments additionnels sont magnésium, manganèse, chrome, titane et béryllium avec la répartition suivante des composants (masse en %): * Magnésium 5,80 -7,20

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In English:

wo'420 claim? 3. Alloy according to claim (1) characterized in that the additional components are magnesium, manganese, chromium, titanium, and beryllium with the following distribution of the components (mass in %) * Magnesium 1,80 -3,80 * Beryllium 0,001 - 0,005 * Manganese or chromium or titanium 0,050 - 0,400

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3. Alliage selon revendication (1) caractérisé en ce que les éléments additionnels sont									
en ce que les éléments additionnels sont									
magnésium, manganèse, chrome, titane, et									
béryllium avec la répartition suivante des									
composants (masse en %)									
* Magnésium 1,80 -3,80									

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In English:

WO'420

4. Alloy according to claim (1) characterized in that the additional components are magnesium, manganese, chromium, titanium, and coppers with the following distribution of the components (mass in %) * Copper 2.80- 4,50 * Magnesium 1,80- 2,50 * Chromium plate or titanium or manganese 0.05 - 0.50

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4. Alliage selon revendication (1) caractérisé en ce que les éléments additionnels sont magnésium, manganèse, chrome, titane, et cuivre avec la répartition suivante des composants (masse en %) * Cuivre 2,80- 4,50

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In English:

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Claim 5

5. Alloy according to claim (1) characterized in that the additional components are manganese, chromium, titanium and molybdenum with the following distribution of the components (mass in %): * Manganese or chromium, or titanium, or molybdenum 0,05 - 0,80.

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5. Alliage selon revendication (1) caractérisé en ce que les éléments additionnels sont manganèse, chrome, titane et molybdène avec la répartition suivante des composants (masse en %):

* Manganèse ou chrome, ou titane, ou molybdène Use the World Keyboard to enter accented or Cyrillic characters.

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In English:

6. Alloy according to any of the claims (1) to (5) is characterized in that these elements can be accompanied by silicon and/or zinc and/or money and/or lithium and/or cobalt and/or nickel and/or iron from 0.05% to 12% and/or one or more metals of the group of rare earth.

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6. Alliage selon l'une quelconque des revendications (1) à (5) est caractérisé en ce que ces éléments peuvent être accompagnés de silicium et/ou zinc et/ou argent et/ou lithium et / ou cobalt et/ou nickel et/ou fer de 0,05% à 12%

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In English:

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7. Manufactoring process of alloy according to any of the claims (1) to (6) consists: * to mould the ingot in a 95/26420 crystallizer with slip at a speed of cooling during crystallization higher than 0,5 °C/s * homogenisation Claim 7 of the ingots at a temperature of 430 °C with 450 °C * hot deformation (rolling or pressing) after the reheating of the ingot of 430 °C with 450 °C, end of deformation to 300 °C * cold deformation due to the intermediate annealing processes at a temperature equalizes with 400 °C, speed of deformation lower than 100s-1 and the heat treatment of the semi-

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* à mouler le lingot dans un cristallisoir à glissement à une vitesse de refroidissement

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